

REMARKS

Applicants submit this Amendment and Response in reply to the Official Action dated June 27, 2008. Applicants submit that the Amendment and Response is fully responsive to the Official Action for at least the reasons set forth herein.

At the onset, Applicants note that claims 1 and 13 has been amended herewith. Notably, claim 1 has been amended to recite, *inter alia*, that the mobile users move between a plurality of access networks. Additionally, the claim has been amended to recite, *inter alia*, that the local proxies are located at the edge of the access networks and a backbone network and that end-to-end communication between said at least one media server and said mobile users is controlled at an application layer. Claim 13 has been similarly amended.

Applicants respectfully submit new claims 15 and 16 for examination. Claim 15 is directed to the plurality of access networks being selected from a group consisting of non-multicast enabled networks and multicast enabled networks. Claim 16 is directed to at least one of the access networks being a non-multicast enabled network.

No new matter has been added to the application in way of the aforementioned amendments.

Applicants respectfully submit that all of the claims are patentable over the references cited in the Official Action.

Claims 1-14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Borella et al., U.S. Patent No. 6,697,354 (hereinafter “Borella”) in view of Marquette et al., U.S. Patent Pub. 2002/0156900 (hereinafter “Marquette”).

Applicants submit that the claimed invention is novel and non-obvious vis-à-vis the cited references.

The claimed invention is directed to an application-layer approach for providing multicast services for distributing content to mobile users traversing networks with diverse multicast capabilities. The application-layer solution allows third-party service providers to support multicast services across access and backbone networks with incompatible multicast capabilities. The claimed multicast architecture overlay on the existing backbone and access network but takes advantage of underlying multicast capabilities when possible.

The claimed architecture comprises multicast proxies that are established in the backbone network and at the edges of the access networks. These proxies relay information from a media server to the users across diverse networks. The diverse networks include networks that are not-enabled for multicasting. The proxies along with the user devices form virtual networks that will be under the full control of the service provider.

In stark contrast, the cited references do not teach an application-layer approach for providing multicast services. In fact, the cited references do not even teach multicast services. At best, Marquette teaches using multicast as a neighborhood discovery mechanism. Marquette explicitly states that the box monitor discovers its neighborhood preferably with a multicast query as a multi-cast IP message. Paragraph 0144. However, the reference is silent regarding multicast services, such as the claimed content distribution. Additionally, Applicants submit that the cited sections do not support the conclusion that Marquette teaches multicast content distribution. Notably, the cited sections describe multiple applications and services. However, the reference does not suggest that the applications and services are “multicast services”.

Marquette proposes ways to provide content to mobile users but not necessarily in an IP multicast fashion. However, the content can be send via a broadcast or a unicast. For example, multiple users requesting the same content can result in the content server sending out multiple streams of the same content, e.g., multiple unicast messages.

In IP multicast, the point is to avoid duplication when possible to reduce network load but still reach the users that want the same content. Marquette does not consider using multicasting in this context.

Borella fails to cure this deficiency. Notably, the Examiner admits at page 3 of the Office Action that “Borella et al does not explicitly teach a telecommunications network with a server that provides content when providing multicast services to mobile users.”

Accordingly, the cited hypothetical combination, whether taken alone or in any theoretical combination, fails to teach or suggest, telecommunications network for providing multicast services for distributing content to mobile users, as recited in claim 1 (similarly recited in claim 13) in addition to method for a mobile user to join a multicast group, as recited in claim 13.

Furthermore, Borella fails to teach local proxies located at the edge of the access networks and a backbone network. The Examiner asserts that the nodes of Borella “read on claimed local proxies”. However, the “nodes” are not located at the edge of the access network and a backbone network, as claimed in claims 1 and 13.

Moreover, Applicants submit that the cited references fail to teach an application layer approach, as claimed. The multicast architecture of the claimed invention overlay on the existing backbone and access network but takes advantage of underlying multicast capabilities when

possible. In addition, the claimed architecture requires only limited control and knowledge of the underlying capabilities of the access and backbone networks. In contrast, both references are a network layer approach.

Additionally, the backbone proxies do not forward packets to the mobile user using the home agent and foreign agent concept (as in Borella et al.). The proxies route multicast packets such that all users which are in the multicast group receive the multicast packets. There is no need for home subnet concept for the mobile users. There is no concept of roaming away from home subnet and using foreign agents since the multicast group has no home subnet concept. The mobile users with the same multicast group are tracked via the multicast routing protocol and IGMP and do not require use of Mobile IP. Forwarding of packets is automatically taken care of via the multicast routing using the virtual network of backbone proxies.

Furthermore, the application-layer multicast architecture of the present invention allows a service provider to efficiently multicast information from a media server, acting as the information source and located in the backbone network, to **the user roaming across different access networks.** Paragraph 0013.

Additionally, Applicants submit that there is no motivation to combine the references.

Marquette is not directed to mobile users. While Borella considers mobile users, there is no suggestion or teaching in the references themselves, to combine the teaching in the manner suggested by the Examiner. One of ordinary skill in the art would not look to a reference that is not directed to mobile users to arrive at a network architecture for a mobile environment, especially, in a mobile environment where the nodes move quickly. There is no likelihood of success. Therefore, it is respectfully submitted that one skilled in the art would not combine the

references in the manner suggested by the Examiner. It is only with the use of hindsight reconstruction provided by Applicants' teachings that one would even look to Borella and Marquette as was done by the Examiner. Certainly, one skilled in the art would not be motivated to combine the references to solve the problem in the manner claimed by Applicants.

Furthermore, the problem of multicasting from a media server to mobile users is very different from the load balancing and resource application of Marquette.

Accordingly, Applicants submit that independent claims 1 and 13 are patentable over the cited references. Applicants further submit that claims 2-12 and 14-16 are patentable over the cited references based at least upon the above-identified analysis.

Applicants submit that the dependent claims are patentable over the cited based at least upon the following additional reasons.

In claim 2 tunneling is not used to forward packets to mobile users moving through different foreign subnets as in Borella. The claimed invention does not use the concept of foreign agent and home agent. In the claimed invention, tunneling is used when a part of the current network path, determined via the multicast routing protocol, from content server to mobile user cannot support full IP multicast.

In claims 3 and 4 tunneling is used in the absence of native IP multicast, not for forwarding packets between foreign agents and home agents in the Mobile IP sense.

With regard to claims 5 and 6, Marquette uses multicast for initial box location discovery. This is different than using multicast for efficient content distribution to multiple users. There is no concept of a virtual network of backbone proxies as claimed by Applicants used specifically for multicast content distribution in Marquette.

Regarding claim 7, as stated above, Marquette uses multicast for neighborhood discovery.

In the claimed invention local proxies advertise multicast services. This multicast service advertisement include such things as the IP multicast capability of the local proxy's network, and the multicast content servers and multicast sessions that can be reached via this proxy.

With regard to claim 8, Marquette does not use multicast for content distribution but only for initial location of monitor boxes. There is no concept of a virtual network of backbone proxies as claimed by Applicants used specifically for multicast content distribution in Marquette.

With respect to claim 9, Marquette does not even mention multicast or tunneling. The claimed invention uses tunneling when the path between proxies or between proxy and mobile user is not multicast-capable. Tunneling is used so mobile users can receive multicast content. However, when the access network does have multicast, and the mobile user moves into such an access network, it does not need to have tunneling. There is dynamic switching at the mobile user based on awareness of the local proxy and access network capability.

In Marquette, IP multicast is used only for discovery queries and not for multicast content distribution in contrast to the invention claimed in claim 10.

Borella uses the external network address and port number for network translation purposes. In addition, Marquette uses address in context of SIP.

In claim 11 addresses are used for multicast session uniqueness and does not require SIP for multicast services. Neither reference teaches a multicast session. Due to the limited number of multicast addresses available, it is necessary to maintain uniqueness of a multicast session so

the claimed invention uses the multicast group address plus the multicast source address for unique identification. The addresses are not used for distributed network address translation as in Borella.

Marquette defines location services as mapping of application or service program to a specific URL or IP address. The location service is used to find the IP address of a particular service program. In claim 12 location services are used to determine the geographical location (GPS) of mobile users. The geographical location information **is used to provide content tailored to that geographic area location-based content such as information on nearby points of interest (emphasis added)**.

In claim 14 the content can be multicast and use multiple paths to reach multiple access networks and mobile users. Some paths may have parts where IP multicast is not available so these legs of the multicast route would use tunneling to transport the multicast content to the next multicast-enabled point or to the mobile user.

With respect to claims 15 and 16, the cited references do not discuss multicast enabled verses non-multicast enabled networks. The claimed invention supports multicasting for both types of networks. Notably, the claimed network and method supports dynamic switching of mobile users to receive multicast content with or without tunneling as needed. Tunneling is used for non-multicast enabled networks.

Based upon the foregoing, Applicants respectfully request that the Examiner withdraw the rejection of claims 1-14 pursuant to 35 U.S.C. § 103(a). Applicants respectfully request the Examiner to allow new claims 15 and 16.

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In view of the above, it is respectfully submitted that the application is in condition for allowance. Accordingly, it is respectfully requested that this application be allowed and a Notice of Allowance issue.

Authorization is hereby given to charge Deposit Account No. 02-1822 the fee due under 37 CFR 1.17(a) of \$1110.00 for a three month extension of the time to reply to the Office Action.

Respectfully submitted,
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